

**TRAVERSE BRAGG RESONANCE LASERS AND AMPLIFIERS AND  
METHOD OF OPERATING THE SAME**

5

**Abstract of the Disclosure**

A transverse Bragg resonance waveguide is comprised of a waveguiding channel, and on at least two opposing sides of the channel two periodic index media; and a means for providing gain in the periodic index media. In one embodiment the waveguiding channel is planar and is sandwiched on two opposing sides by the periodic index media. In another embodiment the waveguiding channel is cylindrical and is surrounded by the periodic index media. The means for providing gain in the periodic index media is electrical or optical pumping. The periodic index media comprises a periodic lattice of regions having an index of refraction distinct from the channel, such as an array of transverse holes defined in a planar semiconductor substrate in which the channel is also defined, or an array of longitudinal holes defined in a cylindrical semiconductor fiber in which the channel is also longitudinally defined.